CHILDHOOD LEAD POISONING IN RHODE ISLAND: THE NUMBERS 2003 EDITION

RHODE ISLAND DEPARTMENT OF HEALTH

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Contents

ELIMINATING LEAD POISONING BY 2010

In February 2000 the President's Task Force on Environmental Health Risks and Safety Risks to Children issued "Eliminating Childhood Lead Poisoning: A Federal Strategy Targeting Lead Paint Hazards[1]." The report includes four recommendations:

- Act before children are poisoned;
- Identify and care for lead poisoned children;
- Conduct research; and
- Measure progress and refine lead poisoning prevention strategies.

The Centers for Disease Control and Prevention (CDC) requires all state and local Childhood Lead Poisoning Prevention Programs (CLPPPs) including the Rhode Island Program to develop a strategic plan to eliminate childhood lead poisoning as a public health problem by year 2010.

Healthy People 2010 defines total elimination of childhood lead poisoning as a zero percent elevated blood lead levels (greater than or equal to 10 μg/dL) in children[2], while the CDC urges states to use local data and define elimination.

In Rhode Island, the Childhood Lead Poisoning Prevention Program conducted analysis of available data to identify the high-risk areas of the state where both housing shortages and high incidence rates of lead poisoning were problematic. Because incidence rates are more precise in reflecting the true risk of lead poisoning, they were used in this analysis. Prevalence rates were not used because they include multiple results from the same children tested more than once over several years.

Based on this analysis of housing quality and incidence of elevated blood lead levels, the Department of Health defines the elimination of childhood lead poisoning by 2010 as follows:

"To decrease the proportion of new cases of lead poisoning in children less than six years of age (defined as a blood lead level of 10 μg/dL or more) to less than 5% in all Rhode Island communities, without significantly decreasing availability of lead safe housing."

This book contains data and information to encourage state and community leaders to join us in informed discussions that will contribute to the development of a plan in support of our goal of eliminating childhood lead poisoning by 2010.

INTRODUCTION

While lead poisoning prevalence rates have been consistently declining over the last decade, nearly 1 in 14 Rhode Island children still have a blood lead level exceeding CDC's standard for concern – a rate at least twice the national average. Furthermore, children living in our state's urban areas and children of certain racial and ethnic backgrounds have lead poisoning prevalence rates substantially higher than the state average. These poisoned children face potentially life-long effects from their lead exposure including, decreased IQ and increased risk for behavioral and learning difficulties.

Despite substantial advancements in screening, case management of lead poisoned children, and removal of lead hazards in homes, much work remains to be done to eliminate racial and ethnic disparities and reduce the prevalence of lead poisoning.

The information in this booklet provides a snapshot that reflects both where we began in lead poisoning and what remains to be accomplished. It is our hope that this information will prompt the reader to appreciate the continuous need to protect Rhode Island's children from the dangers of lead poisoning.

UNDERSTANDING LEAD DATA

By law, all Rhode Island children between the ages of nine months and six years are required to be screened annually for lead. The results of these tests provide the foundation for the majority of the data presented in this booklet*. Blood lead levels (BLL) are measured and reported out as micrograms of lead per deciliter of whole blood (abbreviated µg/dL or mcg/dL).

The CDC has set 10µg/dL as the level at which community level interventions should be implemented. Individual case management is recommended for children with blood lead levels greater than or equal to 20µg/dL or with persistent levels of 15µg/dL and above. Recent research shows the potential for deleterious effects from lead at levels below 10µg/dL[3]. Since there is no nutritional value to lead, the goal is for every child to have as low a level as possible.

Rhode Island currently provides in-home lead education to the families of children with blood lead levels between 15µg/dL and 19µg/dL. Full case management and environmental investigation services are offered to significantly lead poisoned children, defined as those with persistent levels of 15 µg/dL or higher (two fingerstick or venous tests in that range more than 90 days apart) or a single venous result of 20µg/dL or above.

Lead can be measured in blood drawn from the vein or the capillary (collected using "fingersticks"). Fingersticks are less painful for the child; however, they have a greater potential for false positives. For this reason, Rhode Island requires results from a venous sample prior to initiating interventions -- the only exception to this is for persistent blood lead levels. Doctors are encouraged to perform venous tests on children with high capillary values. Unless otherwise noted, the data in this booklet does not distinguish between venous and capillary results.

** It is important to recognize that we have no information on the blood lead levels of children who are not tested, thus the rates in this booklet are only for the tested population. Untested children appear not to differ from the tested children in age, gender, race, location.*

LEAD SCREENING RATES IN RHODE ISLAND

KIDSNET data on Lead Screening Rates

KIDSNET provides a count of all children born in Rhode Island starting in 1997, with records added for children born out of state who utilize a participating program or pediatrician.

- 80% of the 66,599 children in KIDSNET born between 1997 and 2001 who turned one by December 31 of 2002 had at least one lead test.
- There were no substantial differences in screening rates by race or ethnicity.
- Screening rates by town vary widely, from a low of 60% in Middletown to a high of 90% in Jamestown.
- Rates do NOT vary by urbanization – cities, suburbs, and rural areas as a whole have similar rates

Studies show Rhode Island's screening rates are among the best in the nation

- Nationally less than 20% of children are screened[4].
- In 1994, a four-month birth cohort study by Lisa Ahava found that 59% of children were screened for lead poisoning[5]. The rates were found to have increased to 67% in 1996 in a follow-up study using the same methodology.
- 2001 study[6] of 19 to 35 month old children in Medicaid funded managed care programs in Rhode Island showed 80% had at least one lead test.

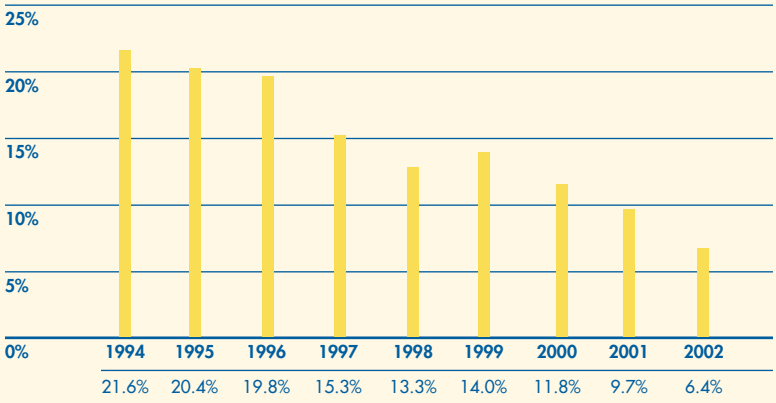
The Department of Health has identified the following barriers to timely screening

- Insufficient availability of laboratory services in the pediatric practices. Parents frequently are required to make a separate trip to have the lead test completed.
- Knowledge and attitudes of pediatric providers that impact on the perceived importance of lead screening and can result in noncompliance with lead screening guidelines.
- Parents' misperception that lead screening tests are routinely performed by pediatric providers or WIC sites, and therefore there is no need for a proactive parental role.

INCIDENCE OF ELEVATED BLOOD LEAD LEVELS

- The incidence rate is defined as the proportion of children with a blood lead level greater than or equal to 10 micrograms per deciliter of blood (µg/dL) for the first time in their lives among Rhode Island children less than six years of age who have never been lead poisoned.
- Data show a significant decline in lead poisoning incidence rates in Rhode Island from 21.6% in 1994 to 6.4% in 2002, as shown in *Figure 1*.
- *Table 1* (page 9) shows detailed data on incidence rates for Rhode Island's 39 cities and towns, by year from 1997 to 2002.
- Prevalence rates, including statewide rates, rates for each of Rhode Island's 39 cities and towns, and other lead related data available on the web: www.health.ri.gov/family/lead/home.

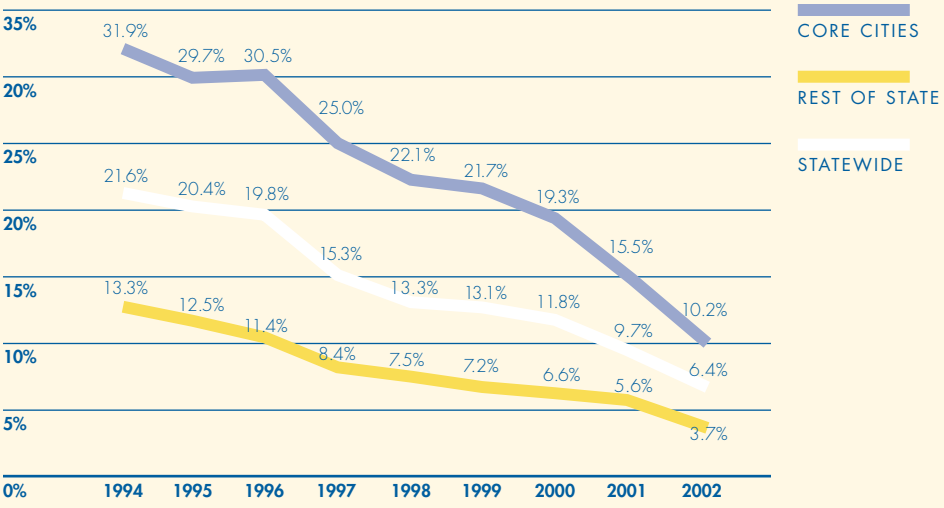
FIGURE 1 INCIDENCE OF LEAD POISONING IN TESTED CHILDREN STATEWIDE 1994 TO 2002 (Percent of New Cases with BLL ≥ 10 µg/dL)



INCIDENCE RATES BY GEOGRAPHIC LOCATION

- Statewide, the incidence rate of elevated blood lead levels (≥ 10 µg/dL) decreased from 21.6% in 1994 to 6.4% in 2002. Between 2001 and 2002, the incidence rate statewide decreased from 9.7% to 6.4%.
- Although a significant decrease has been seen in the number of new cases (incidence rate) statewide, new cases of lead poisoning continue to be concentrated in the five core cities (Central Falls, Newport, Pawtucket, Providence, and Woonsocket).
- Despite these disparities the incidence rate of lead poisoning in the core cites declined from 31.9% in 1994 to 10.2% in 2002. In the last year alone, the incidence rate in the five core cities decreased from 15.5% to 10.2%.

FIGURE 2 **INCIDENCE OF ELEVATED BLOOD LEAD LEVEL BY GEOGRAPHIC LOCATION: CORE CITIES AND STATEWIDE 1994 TO 2002**
(Percent of Tested Children with BLL ≥ 10 µg/dL)



One of the limitations of our data is the instability of address information (city of residence) due to high mobility of families with young children. Some 34% of all RI children born between January 1997 and December 2001 have changed their residence at least once. Therefore, the address where the child has been lead poisoned may not always be the address where the child resided at the time of blood test.

TABLE 1 INCIDENCE RATES

Number of New Cases of Elevated Lead Levels (≥ 10μg/dL) In Children Tested In Rhode Island, Years 1997-2002

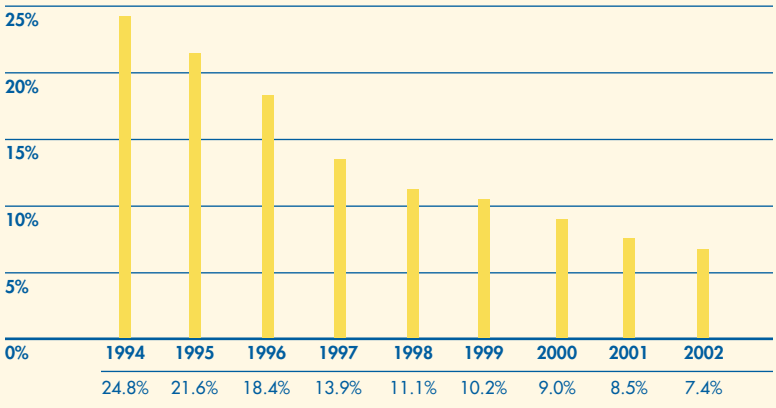
CITY	1997		1998		1999		2000		2001		2002	
BARRINGTON	17	(6.3%)	17	(6.4%)	16	(5.9%)	11	(4.0%)	13	(3.8%)	17	(3.7%)
BRISTOL	38	(12.0%)	27	(10.8%)	30	(13.1%)	11	(4.8%)	27	(7.6%)	25	(5.7%)
BURRILLVILLE	33	(13.2%)	29	(13.5%)	33	(13.5%)	28	(11.4%)	15	(6.3%)	19	(5.9%)
CENTRAL FALLS	141	(34.0%)	106	(27.0%)	101	(21.8%)	112	(24.1%)	89	(15.7%)	93	(12.4%)
CHARLESTOWN	7	(5.5%)	8	(8.4%)	4	(5.3%)	11	(14.7%)	8	(5.4%)	7	(2.6%)
COVENTRY	27	(4.9%)	18	(3.7%)	21	(3.9%)	21	(3.9%)	21	(3.2%)	13	(1.8%)
CRANSTON	99	(10.4%)	79	(8.6%)	89	(9.2%)	77	(8.0%)	72	(5.9%)	68	(4.6%)
CUMBERLAND	20	(4.0%)	12	(2.7%)	23	(4.5%)	22	(4.3%)	26	(4.4%)	11	(1.4%)
EAST GREENWICH	6	(3.7%)	7	(4.4%)	4	(2.5%)	7	(4.5%)	9	(4.3%)	7	(2.8%)
EAST PROVIDENCE	66	(10.7%)	72	(12.0%)	73	(14.1%)	57	(11.0%)	74	(9.3%)	43	(4.3%)
EXETER	8	(4.6%)	4	(3.6%)	3	(3.3%)	4	(4.4%)	5	(5.3%)	3	(3.0%)
FOSTER	1	(0.6%)	2	(1.5%)	0	(0.0%)	3	(2.3%)	7	(4.0%)	0	(0.0%)
GLOCESTER	8	(8.3%)	5	(5.0%)	8	(7.3%)	8	(7.3%)	8	(7.5%)	6	(5.1%)
HOPKINTON	9	(20.5%)	7	(7.5%)	9	(7.3%)	11	(8.9%)	7	(5.0%)	6	(3.1%)
JAMESTOWN	14	(23.7%)	8	(17.8%)	3	(5.9%)	9	(17.6%)	4	(6.0%)	2	(2.3%)
JOHNSTON	20	(5.0%)	20	(5.3%)	21	(6.3%)	9	(2.7%)	24	(5.4%)	18	(3.3%)
LINCOLN	30	(13.3%)	21	(9.6%)	21	(9.7%)	13	(6.0%)	20	(8.5%)	9	(2.7%)
LITTLE COMPTON	3	(6.5%)	0	(0.0%)	7	(16.3%)	9	(20.9%)	4	(7.0%)	4	(5.1%)
MIDDLETOWN	13	(6.6%)	13	(8.9%)	18	(8.6%)	18	(8.6%)	13	(5.0%)	20	(6.6%)
NARRAGANSETT	10	(6.1%)	9	(5.6%)	12	(8.5%)	7	(4.9%)	8	(4.4%)	9	(3.4%)
NEW SHOREHAM	0	(0.0%)	3	(16.7%)	2	(12.5%)	0	(0.0%)	2	(10.5%)	1	N/A
NEWPORT	74	(19.8%)	64	(20.7%)	61	(15.9%)	76	(19.8%)	85	(17.9%)	61	(10.0%)
NORTH KINGSTOWN	41	(11.0%)	21	(6.0%)	10	(2.7%)	19	(5.1%)	28	(5.4%)	15	(2.3%)
NORTH PROVIDENCE	26	(7.0%)	24	(7.0%)	20	(5.8%)	22	(6.4%)	16	(4.2%)	14	(2.8%)
NORTH SMITHFIELD	7	(6.0%)	3	(2.9%)	6	(4.7%)	8	(6.2%)	7	(5.7%)	3	(1.9%)
PAWTUCKET	221	(17.2%)	208	(18.3%)	188	(16.2%)	165	(14.2%)	162	(10.4%)	144	(7.8%)
PORTSMOUTH	15	(7.0%)	20	(9.8%)	12	(5.2%)	14	(6.0%)	17	(6.3%)	14	(4.1%)
PROVIDENCE	1031	(28.5%)	690	(23.3%)	867	(27.3%)	677	(21.3%)	756	(17.0%)	626	(11.5%)
RICHMOND	7	(8.2%)	8	(11.4%)	4	(3.8%)	5	(4.8%)	9	(6.7%)	7	(4.0%)
SCITUATE	7	(46.7%)	9	(34.6%)	6	(14.6%)	4	(9.8%)	6	(17.1%)	1	(2.6%)
SMITHFIELD	10	(4.6%)	10	(5.0%)	8	(4.0%)	9	(4.5%)	7	(2.6%)	2	(0.7%)
SOUTH KINGSTOWN	49	(14.5%)	32	(8.8%)	34	(11.3%)	21	(7.0%)	30	(6.4%)	40	(6.9%)
TIVERTON	25	(12.9%)	17	(8.6%)	11	(6.6%)	16	(9.6%)	26	(10.7%)	23	(6.5%)
WARREN	17	(11.2%)	21	(16.7%)	15	(11.6%)	19	(14.7%)	12	(6.7%)	11	(4.4%)
WARWICK	63	(6.1%)	62	(6.0%)	75	(7.8%)	49	(5.1%)	47	(3.6%)	42	(2.9%)
WEST GREENWICH	1	(1.2%)	2	(2.7%)	2	(2.8%)	2	(2.8%)	2	(2.4%)	4	(3.4%)
WEST WARWICK	49	(10.7%)	33	(7.9%)	44	(10.9%)	22	(5.5%)	34	(6.0%)	25	(3.7%)
WESTERLY	19	(11.6%)	12	(6.7%)	20	(10.0%)	20	(10.0%)	19	(7.1%)	33	(7.6%)
WOONSOCKET	169	(20.8%)	164	(20.3%)	166	(20.0%)	133	(16.0%)	147	(15.5%)	88	(7.2%)
STATEWIDE	2401	(15.3%)	1867	(13.2%)	2047	(14.0%)	1729	(11.8%)	1866	(9.7%)	1534	(6.4%)

N/A: Insufficient data, towns where less than 10 children were tested in a whole year.

PREVALENCE OF ELEVATED BLOOD LEAD LEVELS (≥10 µg/dL)

- The prevalence rate is defined as percentage of children tested in a calendar year with blood lead levels (≥ 10µg/dL amongst all children under 6 years of age tested that year).
- While prevalence rates continue to decline, Rhode Island rates of lead poisoning are substantially higher than the national average. National data show that in 1994, the most recent year available, 4.4% of U.S. children age 1-5 had lead levels ≥ 10µg/dL. During the same year (1994), Rhode Island's rate was six times higher.
- Between 1994 and 2002, lead poisoning rates declined from 24.8% down to a low of 7.4% among children one to five years of age.

FIGURE 3 **PREVALENCE OF LEAD POISONING IN RHODE ISLAND CHILDREN 1-5 YEARS OF AGE, 1994-2002**
(Percent of Tested Children with BLL ≥ 10µg/dL)

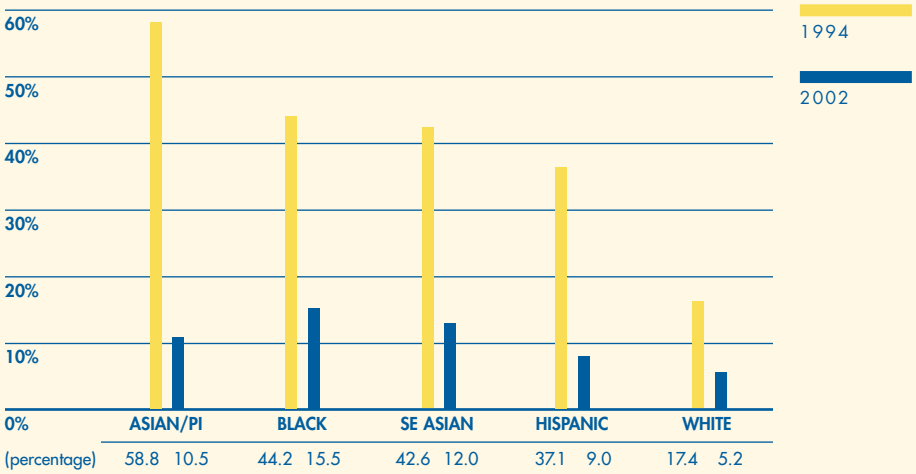


Note: Prevalence is calculated using the highest BLL value a child had in each year.
Children from other states and/or with unknown or invalid addresses have been removed.

LEAD POISONING PREVALENCE RATES BY RACE/ETHNICITY

- The prevalence of lead poisoning declined among all groups between 1994 and 2002, most notably among Asian/Pacific Islanders where a six-fold decrease was noted. Despite significant decreases, prevalence rates of lead poisoning among the various racial/ethnic groups continue to be two to three times greater than those of whites.
- The prevalence of lead poisoning among African Americans decreased from 44.2% in 1994 to 15.5% in 2002. Nevertheless, African Americans have the highest rates of lead poisoning – a rate three times that of whites.
- Racial disparity in lead poisoning is primarily a result of the relative high density of non-white populations in Rhode Island's core cities where lead exposure from old and poorly maintained housing is highest. This conclusion is supported by the fact that there is almost no difference in poisoning rates by race or ethnicity among Providence residents.

FIGURE 4 **PREVALENCE OF ELEVATED BLOOD LEAD LEVELS BY RACE/ETHNICITY (STATEWIDE - 1994 AND 2002)**
(Percent of Tested Children with BLL ≥ 10μg/dL)

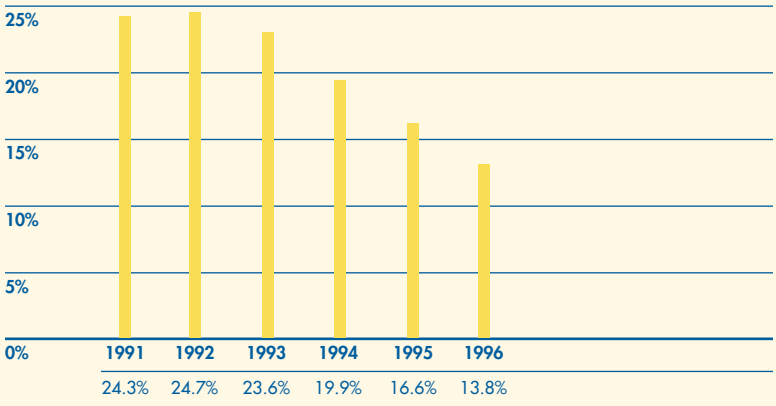


Note: Race/Ethnicity data comes both from lead screening records and KIDSNET.

INCIDENCE BY BIRTH COHORT

- Incidence of lead poisoning by the birth cohort is defined as the percent of children born in a given year ("birth cohort") who are found to have an elevated blood lead level of ≥10μg/dL before their sixth birthday. The number reflects cumulative incidence data for the birth cohort over the six year period.
- The risk of a child being lead poisoned in Rhode Island has decreased. Almost 1 in 4 children born in Rhode Island in 1991 were lead poisoned at some point within the first six years of life compared to 1 in 7 born in 1996. This trend reflects reduced exposure and better protection from environmental lead.

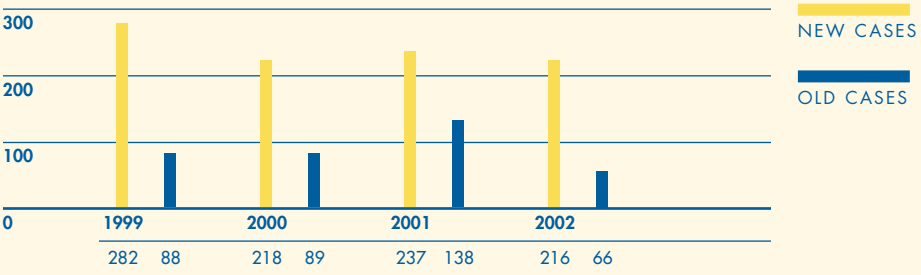
FIGURE 5 CUMULATIVE INCIDENCE OF CHILDHOOD LEAD POISONING 1991-1996
(Percent of Tested Children with BLL ≥ 10μg/dL)



CASE MANAGEMENT OF LEAD POISONED CHILDREN

- Overall, there was a decrease in the number of families referred for case management from 375 in 2001 to 282 in 2002. This is noteworthy, especially since the 282 cases from 2002 included a total of 69 persistent cases (61 new referrals and 8 re-referrals) and the total number and pattern of screening has not changed.
- In year 2001, 12 children were hospitalized due to severe lead poisoning (≥ 45µg/dL). The number of hospitalizations for year 2002 decreased to 7.
- In 2002, families with children who had "significant lead poisoning"* were referred to either the HELP Lead Safe Center or the Family Outreach Program for comprehensive case management services. The HELP Lead Safe Center received 76% of the referrals in 2002.
- In January 2003, Rhode Island expanded its capacity to provide comprehensive case management with the addition of three new lead centers. The following agencies now provide case management services: the HELP Lead Safe Center, Family Service of Rhode Island, Blackstone Valley Community Action Program, and Westbay Community Action Program.

FIGURE 6 **NUMBER OF CHILDREN REFERRED FOR CASE MANAGEMENT SERVICES 1999-2002**
(Number of referrals made)



* Significant Lead Poisoning is one confirmed blood lead level greater than or equal to 20µg/dL or two lead tests that are greater than or equal to 15µg/dL and are at least 90 days apart but no more than 365 days apart. Children from other states and/or with unknown or invalid addresses have been removed.

ENVIRONMENTAL INSPECTIONS

- Environmental inspections are performed at the homes of significantly lead poisoned children to identify lead hazards in violation of State regulation.
- The Health Department works with owners to achieve compliance with lead safe requirements. If necessary, the Department will issue citations, place liens on the property, and refer the case for prosecution by state or local authorities to achieve full compliance.
- In some cases, families opt not to have their property inspected, although efforts to reach the family via case management will continue. The Department also does not enforce compliance if the parent is the owner of the property, but will offer technical advice and clearance inspections. This practice is presently under review.
- The increase in total number of inspections performed in 2001 and 2002 can be attributed to the inclusion of families with a child with persistent blood lead levels in the intervention.

FIGURE 7 ENVIRONMENTAL INSPECTIONS

	1997	1998	1999	2000	2001	2002
Total Inspections Offered	90	459	339	278	328	322
Tenant Refused Inspection or Child Moved	8	133	70	50	95	62
Number of Inspections Performed	82	326	269	228	233	260
Inspection Findings						
No violations found	7	8	4	4	8	3
Lead hazards completely abated	41	161	111	118	95	49
Abatement is complete excluding soil remediation	14	47	43	26	3	
Exterior has been abated, the interior is pending		3	3	4	1	3
Interior has been abated, the exterior is pending	2	9	9	10	4	7
Enrolled in a HUD program, awaiting abatement		7	7	1	7	2
Case remains open with Department of Health	3	5	7	4	10	85
Referred to AG or local authorities for prosecution	7	39	40	31	49	72
The parent is the owner so the case is not prosecuted	7	37	38	27	46	37
Other	1	10	7	3	10	2

Note: Snapshot of the database as of 01/26/03.

TELL US WHAT YOU THINK!

Please take a few minutes to answer the following questions and then fax this page to Anne Primeau-Faubert at (401) 222-5734 or mail it to the address on the back. Your responses will help us to provide the most useful information in future editions of this booklet. Thank you!

1. Please tell us about yourself. Are you (check one):

☐ A health care provider

☐ A social service provider

☐ School Personnel

☐ Other _____

2. Have you visited the Lead Program's website?

☐ Yes ☐ No ☐ Not Sure

3. What are your other sources of information about lead poisoning?

☐ Doctor/Clinic ☐ Poster/Brochures ☐ Hot Line

☐ Other _____

4. What information in this booklet did you find the most useful and why?

_____

_____

5. What information in this booklet did you find the least useful?

_____

_____

6. Was the information in this booklet presented in a clear and understandable fashion?

_____

_____

7. What additional information would be useful to include in future editions of this booklet?

_____

_____

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CHILDHOOD LEAD POISONING PREVENTION PROGRAM

RHODE ISLAND DEPARTMENT OF HEALTH

THREE CAPITOL HILL, ROOM 302

PROVIDENCE, RI 02908-5097

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REFERENCES

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3 "Intellectual Impairment in Children with Blood Lead Concentrations Below 10 mcg per Deciliter" by Richard L. Canfield, Charles R. Henderson Jr., Deborah A. Cory-Slechta, Christopher Cox, Todd Jusko, and Bruce P. Lanphear in New England Journal of Medicine, Volume 348, pages 1517-1526, April 17, 2003, Number 16.

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8 Centers for Disease Control and Prevention, "Update: Blood Lead Levels – United States, 1991-1994," MMWR, Vol. 46(1997), pp. 141-146.

For More Information on Lead Poisoning Data Contact:

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For General Information on Lead Poisoning:
Visit our website at: www.health.ri.gov/family/lead/home.htm
or call the Family Health Information Line at: 1-800-942-7434